Title (en)

Method and apparatus for low bit rate compression of a Higher Order Ambisonics HOA signal representation of a sound field

Title (de)

Verfahren und Vorrichtung zur Komprimierung mit niedrigen Kompressions-Datenraten einer übergeordneten Ambisonics-Signalrepräsentation eines Schallfelds

Title (fr)

Procédé et appareil de compression à faible débit binaire d'une représentation d'un signal HOA ambisonique d'ordre supérieur d'un champ acoustique

Publication

EP 3007167 A1 20160413 (EN)

Application

EP 14306607 A 20141010

Priority

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Abstract (en)

The invention is suited for low bit rate compression of a Higher Order Ambisonics HOA signal representation of a sound field, wherein the HOA signal representation may represent directional signals and a residual ambient component, and wherein the HOA signal representation is spatially sparse due to the low bit rate. From reconstructed signals of said original HOA representation a number of modified phase spectra signals are created using de-correlation filters, which modified phase spectra signals are uncorrelated with the signals of said original representation. The modified phase spectra signals are mixed with each other using predetermined mixing parameters, in order to provide a replicated ambient HOA component. Finally the replicated ambient HOA component is combined with the sparse HOA representation.

IPC 8 full level

G10L 19/008 (2013.01)

CPC (source: CN EP KR US)

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Citation (applicant)

- EP 2665208 A1 20131120 - THOMSON LICENSING [FR]
- EP 2743922 A1 20140618 - THOMSON LICENSING [FR]
- EP 2013059363 W 20130506
- EP 2665208 A1 20131120 - THOMSON LICENSING [FR]
- EP 14306077 A 20140702
- EP 14306347 A 20140902
- V. PULKKI: "Directional audio coding in spatial sound reproduction and stereo upmixing", AES 28TH INTERNATIONAL CONFERENCE, PITEA, June 2006 (2006-06-01)
- J. VILKAMO; T. BAECKSTROEM; A. KUNTZ: "Optimized covariance domain framework for time-frequency processing of spatial audio", J.AUDIO ENG.SOC, vol. 61, no. 6, 2013, pages 403 - 411, XP040633057
- D.D. LEE; H.S. SEUNG: "Learning the parts of objects by nonnegative matrix factorization", NATURE, vol. 401, 1999, pages 788 - 791, XP008056832, DOI: doi:10.1038/44565
- B. RAFAELY: "Plane-wave decomposition of the sound field on a sphere by spherical convolution", J. ACOUST. SOC. AM., vol. 4, no. 116, October 2004 (2004-10-01), pages 2149 - 2157
- J. DANIEL: "PhD thesis", 2001, article "Representation de champs acoustiques, application a la transmission et a la reproduction de scenes sonores complexes dans un contexte multimedia (chapter 3.1)"
- E.G. WIL-LIAMS: "Applied Mathematical Sciences", vol. 93, 1999, ACADEMIC PRESS, article "Fourier Acoustics"

Citation (search report)

- [AD] EP 2743922 A1 20140618 - THOMSON LICENSING [FR]
- [A] HERRE JÜRGEN ET AL: "MPEG-H Audio-The New Standard for Universal Spatial / 3D Audio Co", AES CONVENTION 137; OCTOBER 2014, AES, 60 EAST 42ND STREET, ROOM 2520 NEW YORK 10165-2520, USA, 8 October 2014 (2014-10-08), XP040639004
- [A] DEEP SEN ET AL: "RM1-HOA Working Draft Text", 107. MPEG MEETING; 13-1-2014 - 17-1-2014; SAN JOSE; (MOTION PICTURE EXPERT GROUP OR ISO/IEC JTC1/SC29/WG11),, no. m31827, 11 January 2014 (2014-01-11), XP030060280
- [A] "WD1-HOA Text of MPEG-H 3D Audio", 107. MPEG MEETING;13-1-2014 - 17-1-2014; SAN JOSE; (MOTION PICTURE EXPERT GROUP OR ISO/IEC JTC1/SC29/WG11),, no. N14264, 21 February 2014 (2014-02-21), XP030021001

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DOCDB simple family (application)

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